CLAIMS

1. In a heat exchanger comprising a refrigerant inlet header and a refrigerant outlet header arranged side by side in a front-rear direction, and a refrigerant circulating passage for holding the two headers in communication with each other therethrough, the inlet header having a refrigerant inlet at one end thereof, the outlet header having a refrigerant outlet at one end thereof alongside the inlet end, a refrigerant being permitted to flow from the refrigerant inlet into the inlet header and to return to the outlet header through the circulating passage so as to be sent out from the refrigerant outlet, a semifinished joint plate for making a joint plate joined to both the inlet header and the outlet header and having a refrigerant inlet portion in communication with the refrigerant inlet and a refrigerant outlet portion in communication with the refrigerant outlet,

the semifinished joint plate having a refrigerant inlet portion and a refrigerant outlet portion arranged in a front-rear direction at a spacing, a slit formed between the inlet portion and the outlet portion and extending upward or downward, and slit width adjusting portions extending through the thickness of the semifinished plate and communicating with respective upper and lower ends of the slit.

2. A semifinished joint plate according to claim 1 wherein the slit width adjusting portions have a dimension in the front-rear direction larger than the width of the slit in the front-rear direction.

3. A semifinished joint plate according to claim 2 wherein

the slit width adjusting portions are each in the form of a generally triangular through hole and each have a width increasing as the hole extends away from the slit.

4. A semifinished joint plate according to claim 1 wherein the inlet portion and the outlet portion have respective centers positioned at the same level.

5. A semifinished joint plate according to claim 1 wherein the inlet portion and the outlet portion have respective short cylinders projecting in the same direction.

6. A semifinished joint plate according to claim 5 wherein the short cylinder of the inlet portion is smaller than the short cylinder of the outlet portion in outside diameter.

7. In a heat exchanger comprising a refrigerant inlet header and a refrigerant outlet header arranged side by side in a front-rear direction, and a refrigerant circulating passage for holding the two headers in communication with each other therethrough, the inlet header having a refrigerant inlet at one end thereof, the outlet header having a refrigerant outlet at one end thereof alongside the inlet end, a refrigerant being permitted to flow from the refrigerant inlet into the inlet header and to return to the outlet header through the circulating passage so as to be sent out from the refrigerant outlet, a joint plate joined to both the inlet header and the outlet header and having a refrigerant inlet portion in communication with the refrigerant inlet and a refrigerant outlet portion in communication with the refrigerant outlet, the joint plate being made from a semifinished joint plate according to claim 1 by bending a portion of the semifinished

plate above the upper slit width adjusting portion and a portion thereof below the lower slit width adjusting portion in the direction of width of the semifinished joint plate to thereby shorten the semifinished plate in the front-rear direction, decrease the width in the front-rear direction of the slit and cause the inlet portion and the outlet portion to communicate with the inlet of the inlet header and the outlet of the outlet header respectively.

8. In a heat exchanger comprising a refrigerant inlet header and a refrigerant outlet header arranged side by side in a front-rear direction, and a refrigerant circulating passage for holding the two headers in communication with each other therethrough, the inlet header having a refrigerant inlet at one end thereof, the outlet header having a refrigerant outlet at one end thereof alongside the inlet end, a refrigerant being permitted to flow from the refrigerant inlet into the inlet header and to return to the outlet header through the circulating passage so as to be sent out from the refrigerant outlet, a joint plate joined to both the inlet header and the outlet header and having a refrigerant inlet portion in communication with the refrigerant inlet and a refrigerant outlet portion in communication with the refrigerant outlet,

the joint plate being made from a semifinished joint plate according to claim 5 by bending a portion of the semifinished joint plate above the upper slit width adjusting through hole and a portion thereof below the lower slit width adjusting through hole in a direction opposite to the direction of projection of the inlet portion and the outlet portion to thereby

shorten the semifinished joint plate in the front-rear direction, decrease the width in the front-rear direction of the slit and cause the inlet portion and the outlet portion to communicate with the inlet of the inlet header and the outlet of the outlet header respectively.

9. A joint plate according to claim 7 or 8 wherein the slit is up to 1 mm in width in the front-rear direction after adjustment.

10. A process for fabricating a joint plate according to claim 7 including making a semifinished joint plate according to claim 1 by a method including drawing a metal plate to form a refrigerant inlet bulging portion and a refrigerant outlet bulging portion both projecting in the same direction and each in the form of a short hollow cylinder having a closed top wall, forming a refrigerant inlet portion and a refrigerant outlet portion by making a through hole in the top wall of each of the bulging portions centrally thereof and raising a top wall portion defining the through hole outward to make an upright portion, stamping out a blank of specified shape from the metal plate, forming an upwardly or downwardly extending slit in the blank between the inlet portion and the outlet portion and further forming slit width adjusting portions extending through the thickness of the blank and communicating with respective upper and lower ends of the slit; and thereafter bending a portion of the semifinished joint plate above the upper slit width adjusting portion and a portion thereof below the lower slit width adjusting portion in the direction of thickness of the semifinished joint plate to thereby shorten

the semifinished plate in a front-rear direction and decrease the width in the front-rear direction of the slit.

11. A process for fabricating a joint plate according to claim 10 wherein a portion of the semifinished joint plate above the upper slit width adjusting portion and a portion thereof below the lower slit width adjusting portion are bent in a direction opposite to the direction of projection of the inlet portion and the outlet portion.

12. A heat exchanger comprising a refrigerant inlet header and a refrigerant outlet header arranged side by side in a front-rear direction, and a refrigerant circulating passage for holding the two headers in communication with each other therethrough, the inlet header having a refrigerant inlet at one end thereof, the outlet header having a refrigerant outlet at one end thereof alongside the inlet end, a refrigerant being permitted to flow from the refrigerant inlet into the inlet header and to return to the outlet header through the circulating passage so as to be sent out from the refrigerant outlet,

the heat exchanger further comprising a joint plate according to claim 7, the joint plate being joined to both the inlet header and the outlet header and having a refrigerant inlet portion and a refrigerant outlet portion in communication with the inlet of the inlet header and the outlet of the outlet header respectively.

13. A heat exchanger according to claim 12 wherein the refrigerant circulating passage comprises an intermediate header opposed to the inlet header, an intermediate header

opposed to the outlet header, a plurality of intermediate headers opposed to each other and a plurality of heat exchange tubes, and a plurality of heat exchange tubes are arranged at a spacing between each of the opposed pair of inlet header and intermediate header, the opposed pair of outlet header and intermediate header and the opposed pair of intermediate headers to provide a tube group in the form of at least one row and constitute a heat exchange core, the heat exchange tubes of the tube group having opposite ends jointed to the respective headers of the opposed pair.

14. A heat exchanger according to claim 12 wherein the refrigerant circulating passage comprises a refrigerant inflow header opposed to the inlet header, a refrigerant outflow header opposed to the outlet header and a plurality of heat exchange tubes, the inflow header and the outflow header being in communication with each other to provide a refrigerant turn portion, and a plurality of heat exchange tubes being arranged at a spacing between each of the opposed pair of inlet header and inflow header and the opposed pair of outlet header and outflow header to provide a tube group in the form of at least one row and constitute a heat exchange core, the heat exchange tubes of the tube group having opposite ends joined to the respective headers of the opposed pair.

15. A heat exchanger according to claim 12 wherein a portion of the joint plate above the upper slit width adjusting portion and a portion thereof below the lower slit width adjusting portion are bent toward the inlet header and the outlet header, and the bent portions are in engagement with respective engaging

portions provided between the inlet header and the outlet header.

16. A heat exchanger according to claim 14 wherein the outlet header has interior divided by separating means into first and second two spaces arranged in the direction of height, and the heat exchange tubes extend into the first space, the separating being provided with a refrigerant passing hole, the second space of the outlet header being in communication with the refrigerant outlet.

17. A refrigeration cycle comprising a condenser and an evaporator, the evaporator comprising a heat exchanger according to any one of claims 12 to 16.

18. A vehicle having installed therein a refrigeration cycle according to claim 17 as a vehicle air conditioner.